

ABSTRACT

Performing dead reckoning navigation for persons on foot with improved accuracy. Accelerometers in a navigation device are used to deduce when abnormal steps are being taken and modify navigation calculations accordingly. Running and walking sideways or backwards are among the situations which can be detected and compensated. One embodiment of the invention is a pedometer which is attached to the user's waist or torso. Various correlations are used to distinguish between running versus walking, forward steps versus backward steps, left turn versus right turn, and the slope of the terrain being traveled. Various algorithms are used to distinguish between such motions and accurately track the distance and direction traveled.